19 March 1997
NRL 5524

PURCHASE DESCRIPTION

MINI OPTICAL TIME DOMAIN REFLECTOMETER

TDFAC-E

1.0 **GENERAL** This procurement requires a portable, high resolution, solid state, mini optical time domain reflectometer (mini OTDR) capable of locating and measuring events, such as faults and splices, in multimode optical fiber cables at wavelengths of 850 nanometers (nm). The mini OTDR shall be capable of performing calibrated optical attenuation and distance measurements in both an analysis and trace modes.

2.0 **CLASSIFICATION** The equipment shall meet the requirements of MIL-PRF-28800( ), class 3, for Navy shipboard, submarine and shore applications with the following modifications and exceptions:

a. The non-operating temperature requirement is limited to the range of -20°C to +60°C.
b. The operating temperature/humidity is limited to 0°C to +40°C/< 85% RH.

3.0 **OPERATIONAL REQUIREMENTS** The equipment shall be capable of locating events and faults, as well as making measurements within the parameters and accuracies specified herein.

3.1 Light Source

3.1.1 Wavelength: 850 ±30 nm

3.1.2 Fiber/Interface: 62.5/125; ST connector
3.1.2.1 Fiber Patchcords: A 3 meter jumper for connecting the mini OTDR mating connector to each
3.1.2.1.1 Connectors: Biconic | FC | SMA 906
3.1.2.1.2 Bare Fiber: 50/125 | 62.5/125
3.1.2.1.3 Patchcords shall not introduce more than 1.0 dB one-way loss.

3.1.3 Dead Zone
3.1.3.1 Attenuation: ≤17 m (recovery to within 0.5 dB of linear backscatter for -20 dB reflectance)
3.1.3.2 Event: ≤ 6 m (1.5 dB recovery from saturated Fresnel reflection)

3.2 Vertical Axis: Attenuation/Loss Parameters

3.2.1 Dynamic Range: ≥ 10 dB defined as the vertical difference in dB between the intersection of the extrapolated backscatter trace at the power axis and a level 0.3 dB above 98% of the noise floor for the one-way loss for the mini OTDR.

3.2.2 Resolution: ≤ 0.1 dB

3.2.3 Accuracy: 0.05dB/dB or 0.1 dB whichever is greater

3.2.4 Measurement Modes: Loss between 2 points

3.2.5 Automatic mode: Shall make measurements on fiber without requiring parameter setup by operator

3.2.6 Minimum Fault Threshold: At least 0.25 dB

3.3 Horizontal Axis: Distance Measurement

3.3.1 Range: 2 km or less

3.3.2 Accuracy: ≤2.0 m

3.3.3 Marker Resolution: 1 m

3.3.4 Index of Refraction
3.3.4.1 Range: At least 1.4000 to 1.5999
3.3.4.2 Resolution: 0.0001

3.4 Display Mini OTDR shall present the data from measurements in both graphical and alphanumeric form on a backlit (at least 6 inch diagonal) LCD screen.

3.4.1 Graphical: Visual observation of fiber characteristic (trace) in dB on the vertical axis versus fiber distance in meters/feet on the horizontal axis. Trace shall be capable of showing both the entire range and a magnified portion of the range.

3.4.2 Alphanumeric: The following parameters shall be displayed:

(1) Date
(2) Distance range
(3) Index of refraction
(4) Horizontal scale dist/div
(5) Marker distance
(6) Loss between markers (dB)

3.4.3 Markers/Cursors: At least two movable on-screen indicators capable of being positioned at any point on graphical trace with resolution of 1 m

3.5 Data Handling

3.5.1 Data Storage: Internal 3.5 in. floppy drive or plug-in PCMCIA memory card drive

4.0 GENERAL REQUIREMENTS

4.1 Power Source DC rechargeable battery
4.1.1 Battery Life: At least 4 hrs after battery is fully charged
4.1.1.2 Recharge Time: ≤ 14 hrs (Battery shall be fully charged.)
4.1.1.3 Life Indicator: Indicator shall display low battery condition.
4.1.2 AC Adaptor: 115 Vac ±10%, single phase, at 50/60 Hz ±10%

4.2 Lithium Batteries Per MIL-PRF-28800( ), lithium batteries are prohibited without prior authorization. Requests for approving the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

4.3 Dimensions Portable, less than 6000 cm^3

4.4 Weight The overall weight of the unit shall not exceed 5 kg (11 lb).

4.5 Printer Port The unit shall incorporate either a RS-232C serial port or a parallel port for interconnecting to an external printer to produce hardcopy printouts.

4.6 Carrying Case A case shall be provided for transporting the mini OTDR and all accessories.

4.7 Accessories A video tape (VHS format) showing the features and basic operation of the mini optical time domain reflectometer shall be provided.